

WHAT IS CLAIMED IS:

1. A lamp device for vehicle comprising a light source,  
a reflector whose reflecting surface is a free curved surface,  
and a lens without a prism, wherein light reflected by said  
5 reflector passes through said lens to be radiated to the  
outside as a target light distribution pattern,

wherein said lens has a concave shape in vertical cross  
section and a flat shape in transverse cross section.

10 2. The lamp device for vehicle according to claim 1,  
wherein the reflecting surface of said reflector is a  
substantially ellipsoidal surface in vertical cross section,  
which is greater than said lens, and is a substantially  
paraboloidal surface in transverse cross section, which is  
15 substantially the same size as said lens.

3. A lamp device for vehicle comprising a light source,  
a reflector whose reflecting surface is a free curved surface,  
and a lens without a prism, wherein light reflected by said  
20 reflector passes through said lens to be radiated to the  
outside as a target light distribution pattern,

wherein said lens has a flat shape in vertical cross  
section and a concave shape in transverse cross section.

4. The lamp device for vehicle according to claim 3,  
wherein the reflecting surface of said reflector is a  
substantially paraboloidal surface in vertical cross  
section, which is substantially the same size as said lens,  
5 and is a substantially ellipsoidal surface in transverse  
cross section, which is greater than said lens

5. A lamp device for vehicle comprising a light source,  
a reflector whose reflecting surface is a free curved surface,  
10 and a lens without a prism, wherein light reflected by said  
reflector passes through said lens to be radiated to the  
outside as a target light distribution pattern,

wherein said lens has a convex shape in vertical cross  
section and a flat shape in transverse cross section.

15

6. The lamp device for vehicle according to claim 5,  
wherein the reflecting surface of said reflector is a  
substantially hyperboloidal surface in vertical cross  
section, which is smaller than said lens, and is a  
20 substantially paraboloidal surface in transverse cross  
section, which is substantially the same size as said lens.

7. A lamp device for vehicle comprising a light source,  
a reflector whose reflecting surface is a free curved surface,  
25 and a lens without a prism, wherein light reflected by said

reflector passes through said lens to be radiated to the outside as a target light distribution pattern,

wherein said lens has a flat shape in vertical cross section and a convex shape in transverse cross section.

5

8. The lamp device for vehicle according to claim 7, wherein the reflecting surface of said reflector is a substantially paraboloidal surface in vertical cross section, which is substantially the same size as said lens, and is a substantially hyperboloidal surface in transverse cross section, which is smaller than said lens

9. The lamp device for vehicle according to claim 1, wherein the free curved surface formed on the reflecting surface of said reflector is a Non-Uniform Rational B-Spline Surface (NURBS).

10. The lamp device for vehicle according to claim 2, wherein the free curved surface formed on the reflecting surface of said reflector is a Non-Uniform Rational B-Spline Surface (NURBS).

11. The lamp device for vehicle according to claim 3, wherein the free curved surface formed on the reflecting surface of said reflector is a Non-Uniform Rational B-Spline

Surface (NURBS).

12. The lamp device for vehicle according to claim 4,  
wherein the free curved surface formed on the reflecting  
5 surface of said reflector is a Non-Uniform Rational B-Spline  
Surface (NURBS).

13. The lamp device for vehicle according to claim 5,  
wherein the free curved surface formed on the reflecting  
10 surface of said reflector is a Non-Uniform Rational B-Spline  
Surface (NURBS).

14. The lamp device for vehicle according to claim 6,  
wherein the free curved surface formed on the reflecting  
15 surface of said reflector is a Non-Uniform Rational B-Spline  
Surface (NURBS).

15. The lamp device for vehicle according to claim 7,  
wherein the free curved surface formed on the reflecting  
20 surface of said reflector is a Non-Uniform Rational B-Spline  
Surface (NURBS).

16. The lamp device for vehicle according to claim 8,  
wherein the free curved surface formed on the reflecting  
25 surface of said reflector is a Non-Uniform Rational B-Spline

Surface (NURBS).

17. The lamp device for vehicle according to claim 1,  
wherein a torus curved surface or a free curved surface is  
5 formed on the front surface and/or the rear surface of said  
lens.

18. The lamp device for vehicle according to claim 2,  
wherein a torus curved surface or a free curved surface is  
10 formed on the front surface and/or the rear surface of said  
lens.

19. The lamp device for vehicle according to claim 3,  
wherein a torus curved surface or a free curved surface is  
15 formed on the front surface and/or the rear surface of said  
lens.

20. The lamp device for vehicle according to claim 4,  
wherein a torus curved surface or a free curved surface is  
20 formed on the front surface and/or the rear surface of said  
lens.

21. The lamp device for vehicle according to claim 5,  
wherein a torus curved surface or a free curved surface is  
25 formed on the front surface and/or the rear surface of said

lens.

22. The lamp device for vehicle according to claim 6,  
wherein a torus curved surface or a free curved surface is  
5 formed on the front surface and/or the rear surface of said  
lens.

23. The lamp device for vehicle according to claim 7,  
wherein a torus curved surface or a free curved surface is  
10 formed on the front surface and/or the rear surface of said  
lens.

24. The lamp device for vehicle according to claim 8,  
wherein a torus curved surface or a free curved surface is  
15 formed on the front surface and/or the rear surface of said  
lens.

25. The lamp device for vehicle according to claim 9,  
wherein a torus curved surface or a free curved surface is  
20 formed on the front surface and/or the rear surface of said  
lens.

26. The lamp device for vehicle according to claim 10,  
wherein a torus curved surface or a free curved surface is  
25 formed on the front surface and/or the rear surface of said

lens.

27. The lamp device for vehicle according to claim 11,  
wherein a torus curved surface or a free curved surface is  
5 formed on the front surface and/or the rear surface of said  
lens.

10 28. The lamp device for vehicle according to claim 12,  
wherein a torus curved surface or a free curved surface is  
formed on the front surface and/or the rear surface of said  
lens.

15 29. The lamp device for vehicle according to claim 13,  
wherein a torus curved surface or a free curved surface is  
formed on the front surface and/or the rear surface of said  
lens.

20 30. The lamp device for vehicle according to claim 14,  
wherein a torus curved surface or a free curved surface is  
formed on the front surface and/or the rear surface of said  
lens.

25

31. The lamp device for vehicle according to claim 15, wherein a torus curved surface or a free curved surface is formed on the front surface and/or the rear surface of said lens.

5

32. The lamp device for vehicle according to claim 16, wherein a torus curved surface or a free curved surface is formed on the front surface and/or the rear surface of said lens.

10